



Directorate of Intelligence

12763

Top Secret

(b)(1) (b)(3) (S)

The Iran-Iraq War: Some Oil Vulnerability Issues

An Intelligence Assessment

APPROVED FOR RELEASE DATE: APR 2002 Top Secret

GI 82-101 SC

Copy 024



Warning Notice

Intelligence Sources and Methods Involved (WNINTEL)

National Security Information

Unauthorized Disclosure Subject to Criminal Sanctions

Dissemination Control Abbreviations	_	
- 1		





\	Top Secret	

The Iran-Iraq War: Some Oil Vulnerability Issues

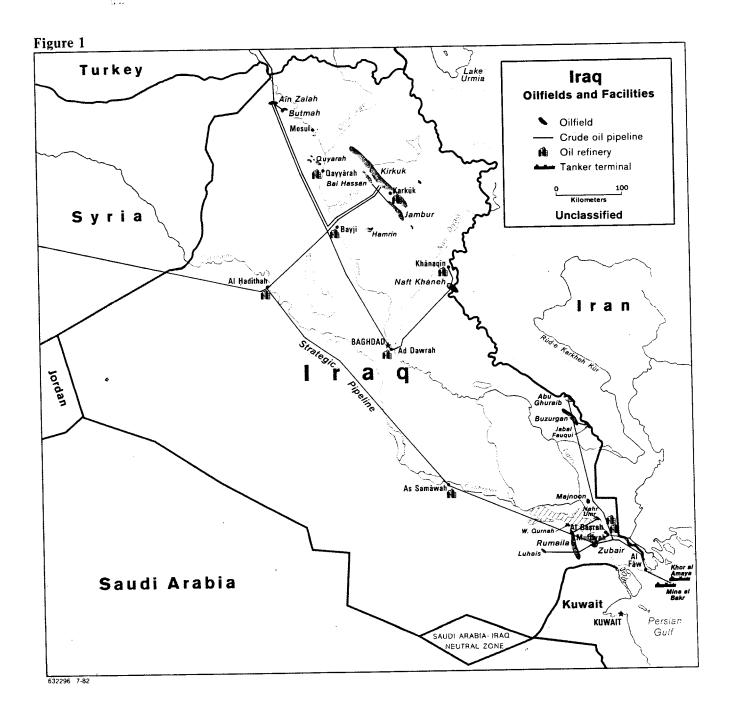
An Intelligence Assessment

Top Secret G1 82-10157C

July 1901

E.			Top Secret
· · · · · · · · · · · · · · · · · · ·		The Iran-Iraq War: Some Oil Vulnerability Issues	
	Key Judgments	During the first two weeks of intensified hostilities damage to oil facilities in the belligerent countries targeted facilities, however, and we expect these Beyond this we are concerned about the risks of systems of Kuwait, Saudi Arabia, and possibly Al highly vulnerable to Iranian attack	s. Both sides have attempts to continue. lamage to the petroleum
	6		
		Information available as of 21 July 1982 has been used in the preparation of this report.	
		iii	Top Secret <i>GI 82-10\(57C</i>





To Secret

iv

THAIL.	LIBRA	٠,
100	<u> </u>	

Top	Secr	et	

The Iran-Iraq War: Some Oil Vulnerability Issues

Introduction

The latest round of Iran-Iraq fighting once again jeopardizes major petroleum facilities in the Persian Gulf region. The invasion places Iranian ground forces close to Iraq's southern oilfields, and the Iranian Air Force remains within easy striking distance of the Northern petroleum system, which currently accounts for all Iraqi oil exports—600,000-700,000 b/d. Iraq, for its part, is attempting to interdict Iranian oil sales by bombing Kharg Island, the terminal handling most of Iran's crude exports. Beyond this, there is a substantial risk that the war will spread into Kuwait and Saudi Arabia.

Iran-Iraq Facility Vulnerability

The petroleum production and export systems in both countries are vulnerable at a number of choke points. Many of these choke points—export terminals, storage facilities, pump stations, and crude processing facilities—have been subject to sporadic attacks since the war began in late September 1980. Iraq has suffered extensive damage, particularly to its Persian Gulf offshore export terminals. In contrast, damage to key choke points in Iran's petroleum system before the current offensive has been minimal.

Iraqi Facilities. The continued flow of Iraqi oil exports is entirely dependent on oil production from Iraq's northern oilfields. The only outlet for this crude is the pipeline through Turkey to Yumurtalik on the Mediterranean. Both the pipeline and production system are highly vulnerable to disruption. Iran, for example, could interdict this pipeline through sabotage in either Iraq or Turkey or by air attacks against the pump stations along the line. Sporadic sabotage has taken place during the war, but the flow through the Turkish pipeline has only been interrupted for short periods. Another key facility is the large crude processing complex at Kirkuk. Iran already has knocked out three of the 14 plants at this facility, which has caused the loss of 640,000 b/d in desorbing capacity

From an oil market viewpoint, the oil system in southern Iraq is of little concern. No oil has been exported from the Persian Gulf since the beginning of the war. Moreover, the most important facilities—Iraq's two sea island export terminals in the Persian Gulf—have already been rendered inoperable. Damascus's closure in March 1982 of the Iraq-Syria pipeline to the Mediterranean effectively shut down all remaining export outlets for southern Iraqi crude. The major petroleum facilities in this area might still constitute lucrative targets for Iran. While damage in these areas would not impair current Iraqi export capability, it would complicate postwar reconstruction

Iranian Facilities. Iran's most vulnerable choke point is the Kharg Island oil export terminal. The terminal, designed to export more than 6 million b/d, consists of an oil-loading jetty on one side of the island, a sea island off the other side, and a conventional buoymooring system. Approximately 25 million barrels of storage capacity are also located on the island. Iraq has conducted sporadic airstrikes against Kharg Island during the past 22 months, but damage never posed much more than a short-term inconvenience to Iranian petroleum operations. Other important petroleum facilities in Iran include three mainland booster stations that pump crude from the oilfields to Kharg Island. Iraq attacked the Gurreh booster complex last September, but damage was not serious. Iran has more than sufficient capacity to enable it to bypass damage to Gurreh and still maintain export levels.

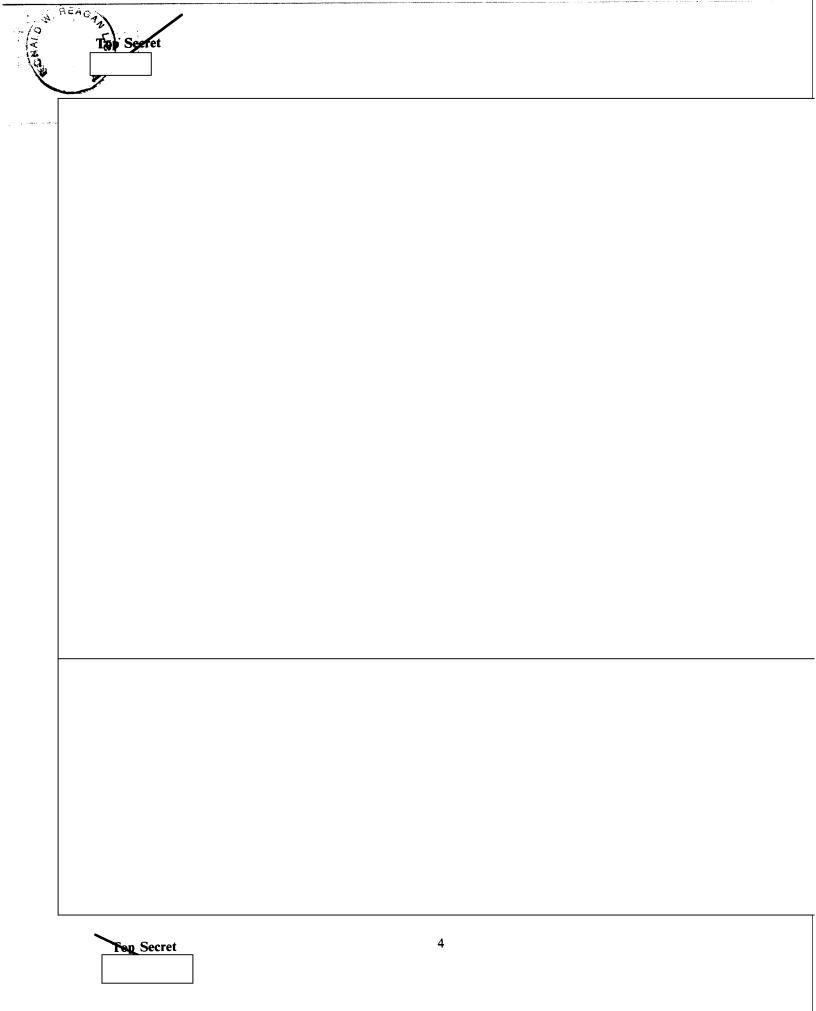
Recent Military Activity

According to our information, the current fighting has not significantly damaged petroleum facilities in either belligerent country. This could change, given the nature of the fighting and the proximity to highly exposed facilities. Shortly after Iran launched its

Top Secret

RE REIO	Ten Secret	
	offensive. Iraq claimed to have bombed Kharg Island. Two tankers reportedly were strafed, but not seriously damaged. This pattern is similar to most previous Iraqi airstrikes against Kharg Island. There is only one previous incident where a tanker, of Turkish registry, was damaged at Kharg Island. No other significant damage is reported at other oil facilities in	highly concentrated and extremely vulnerable to sabotage or direct military action. Iran already has demonstrated its capability to inflict damage to the facilities. In early October 1981, Iranian F-4 fighters attacked Kuwait's largest gas-oil separation plant (Umm al'Aysh) at the Raudhatain Oilfield. Within a
	Vulnerability Elsewhere We are most concerned about the damage that could be inflicted on oil facilities in Kuwait and Saudi Arabia. Their oil production and export systems are	Kuwait. By far the most critical and vulnerable Kuwaiti petroleum choke points are the offshore and onshore terminal loading facilities at Ahmadi, as well

SEACTIVE DE SEACTI	Top Secret







as the two tank farms and manifold stations located nearby. Major damage to these facilities would seriously impair Kuwait's ability to export crude because Ahmadi constitutes the only existing outlet. Damage to large numbers of the more than two dozen gas-oil separation plants (gathering centers) would also critically impair Kuwaiti productive capacity. Most facilities in Kuwait are easily accessible and are close to each other. Well-organized attacks could at worst halt all Kuwaiti exports for several months. See annex A for a detailed discussion of Kuwaiti facility vulnerability.

Targeting and Security

Saudi Arabia and Kuwait are aware of their vulnerability, and have taken countermeasures during the past year to provide early warning and to make it more difficult for Iranian commandos to reach their coastal petroleum facilities. These include an increase in air and naval patrols around potential target areas, the positioning of guards at some offshore oil facilities, and tighter controls on access to installations. Both countries also are reviewing engineering recommendations that would reduce the vulnerability to disruption. Despite these measures, Tehran could still seriously damage petroleum installations in various Persian Gulf countries.



Oil Facility Restoration

If key facilities are damaged, major work programs would be needed for restoration and repair. To evaluate this issue we have analyzed the leadtime required to restore major petroleum facilities in the Gulf region. A key problem is that many critical components of these oil facilities—for example, high pressure separation valves, storage tanks, loading arms, and crude stabilization columns—are custom-ordered equipment and not generally stocked. Replacement, delivery, and installation could require several months or more

The following examples illustrate leadtimes needed to repair facilities or choke points:

- Iraq's damaged sea island terminals would require as long as two years to be restored. To shorten the time needed to resume Persian Gulf exports, Baghdad has accepted the plan of a US petroleum facilities construction firm to build makeshift facilities and resume partial loadings from single-point mooring buoys. The equipment has already been procured over several months and is being stored in Bahrain until the war is over. Even with this planning completed, Iraq must still wait four months for on-site fabrication and installation before the first crude could be exported.
- Saudi Arabia suffered two industrial accidents during the past four years, seriously damaging most essential equipment at two gas-oil separation plants. In each case, 10 to 12 months were needed to bring these facilities back in operation. Similarly, Kuwait faces at least a one-year restoration effort at its gas-oil separation plant bomb damaged by Iran last October.

Based on a variety of information,

it appears that Persian Gulf
countries have initiated planning to reduce the re-

countries have initiated planning to reduce the required snapback time in an emergency. Among the measures under consideration are the construction of bypasses around critical choke points, contingency plans to cannibalize equipment from less essential facilities, and the development of a strategic inventory

Selected Indicators of Oil Market Conditions

Weak Market Indicators

War ends soon, and Iraq increases exports quickly.

Continued hostilities between Iran and Iraq but no futher disruption of oil supplies.

Economic recovery is delayed.

Oil consumption remains depressed.

Continued voluntary inventory drawdowns.

Price competition among OPEC members spreads as individual countries attempt to increase sales.

Tight Market Indicators

War causes a prolonged disruption in Iranian and Iraqi exports.

Current hostilities cause substantial additional damage to Iranian and Iraqi oil production or export capabilities.

War causes disruption of tanker and pipeline flows from the Persian Gulf.

War escalates into neighboring countries damaging export and production facilities and disrupting oil flows.

Economic recovery is rapid and oil consumption begins to climb.

Voluntary inventory destocking ends soon and demand for OPEC oil rebounds sharply.

OPEC countries maintain production ceilings for several more months.

of critical equipment. Despite these efforts, we do not believe the Saudis or Kuwaitis can rebuild rapidly any key facility that has sustained major damage. See annex C for more detail on the issue of replacement equipment availability.

Some Oil Market Risks

The oil market has reacted relatively calmly to the Iranian invasion because fighting has inflicted no major new damage to oil facilities or seriously threatened supply routes. The risk to the market is that the conflict will escalate to neighboring regions and disrupt the flow of oil. Surplus capacity, including inventories outside the Gulf, is insufficient to handle

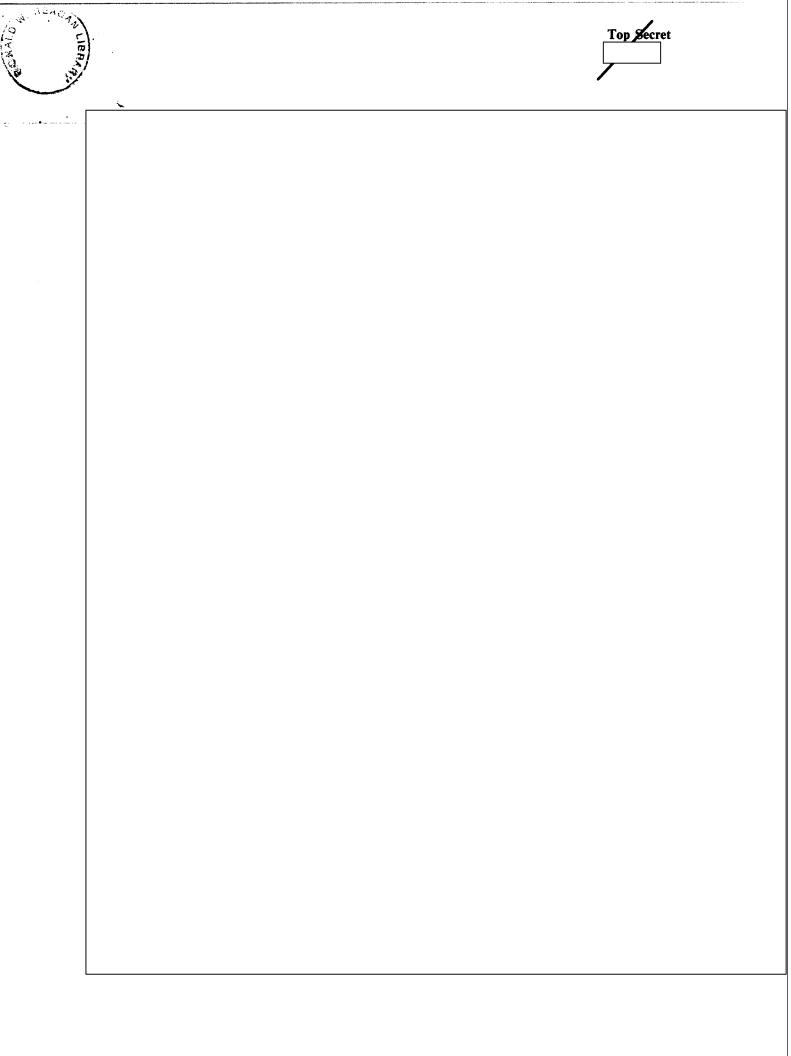


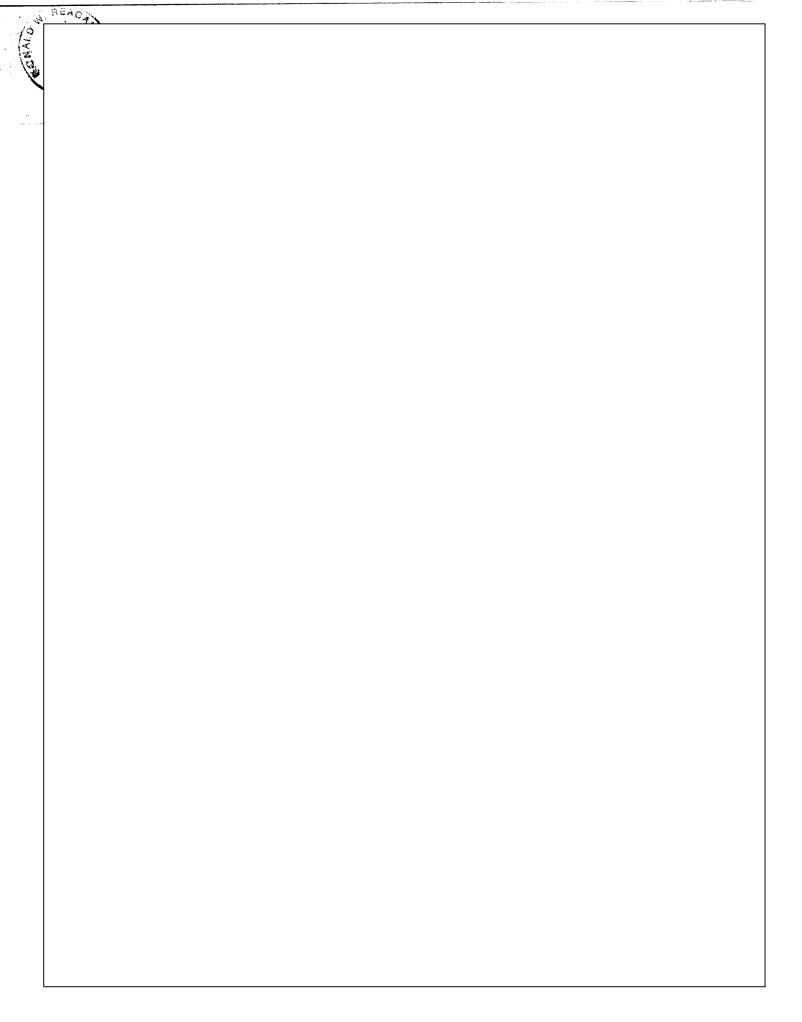


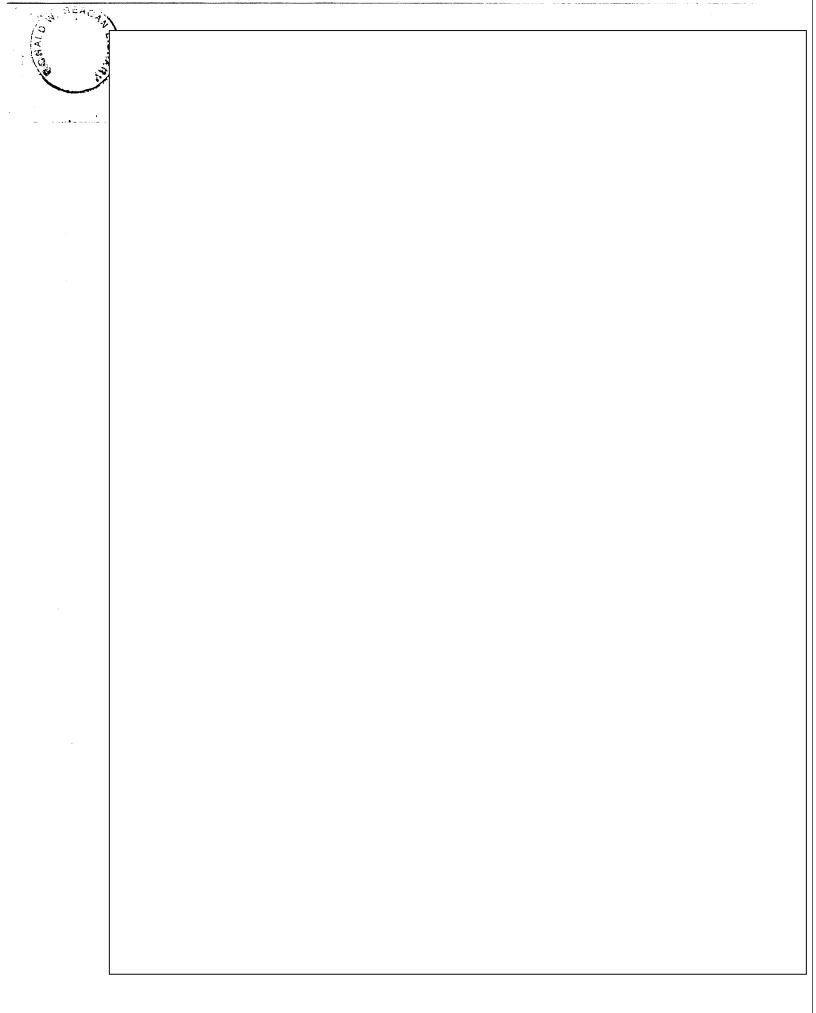
the potential loss of supplies if the conflict spreads. Excess oil production capacity outside the Gulf now amounts to about 3 million b/d. According to industry sources, inventories in major consuming countries have been pared to about 200-300 million barrels above normal levels

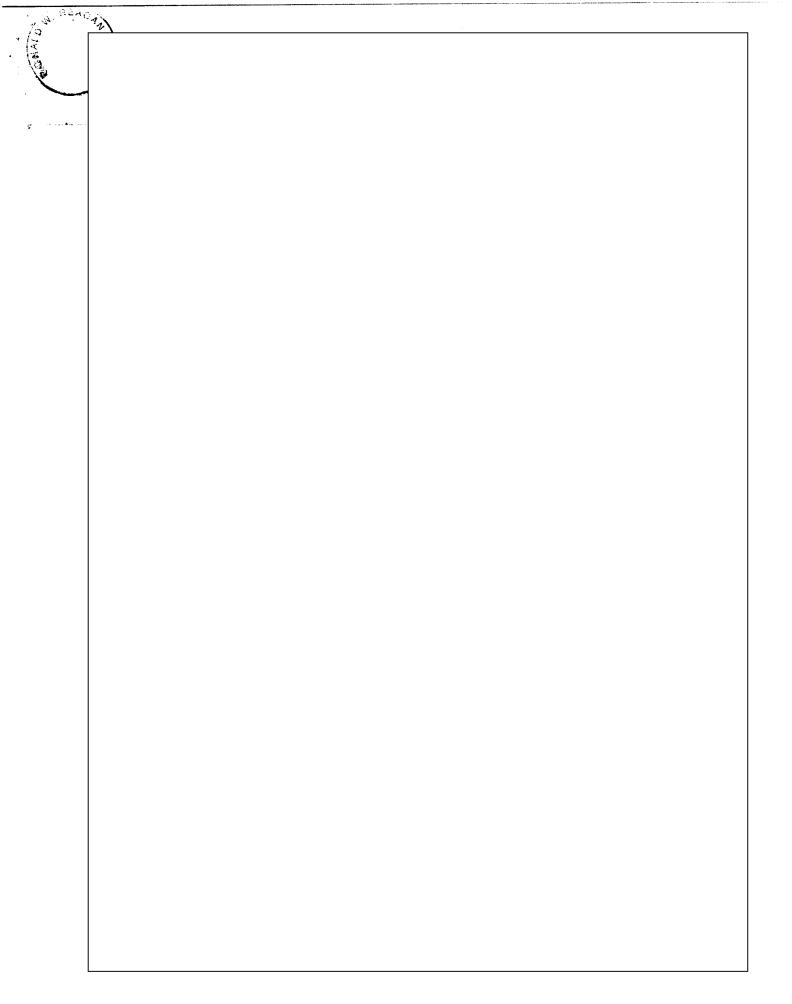
Developments on the Iran-Iraq front could affect the oil market in widely different ways:

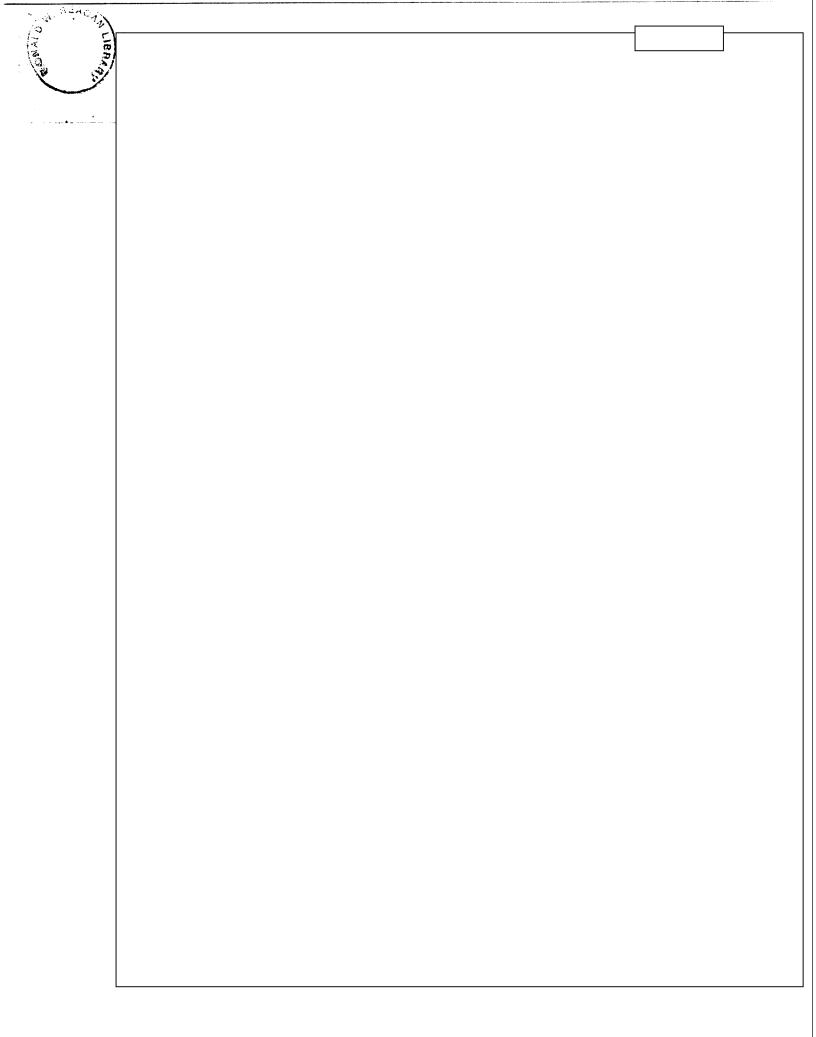
- The combat could drag on for many months, with enough military action to halt all exports from Iraq and all or most of the 2 million b/d that Iran has been exporting in recent months. The oil market would tighten quickly and the risks of spillover to Kuwait and perhaps Saudi Arabia may be greatest.
- The conflict could end quickly. If oil production in Iraq is restored quickly while demand for oil remains weak, Saudi Arabia would have to absorb unprecedented production cuts to prevent a collapse in oil prices.

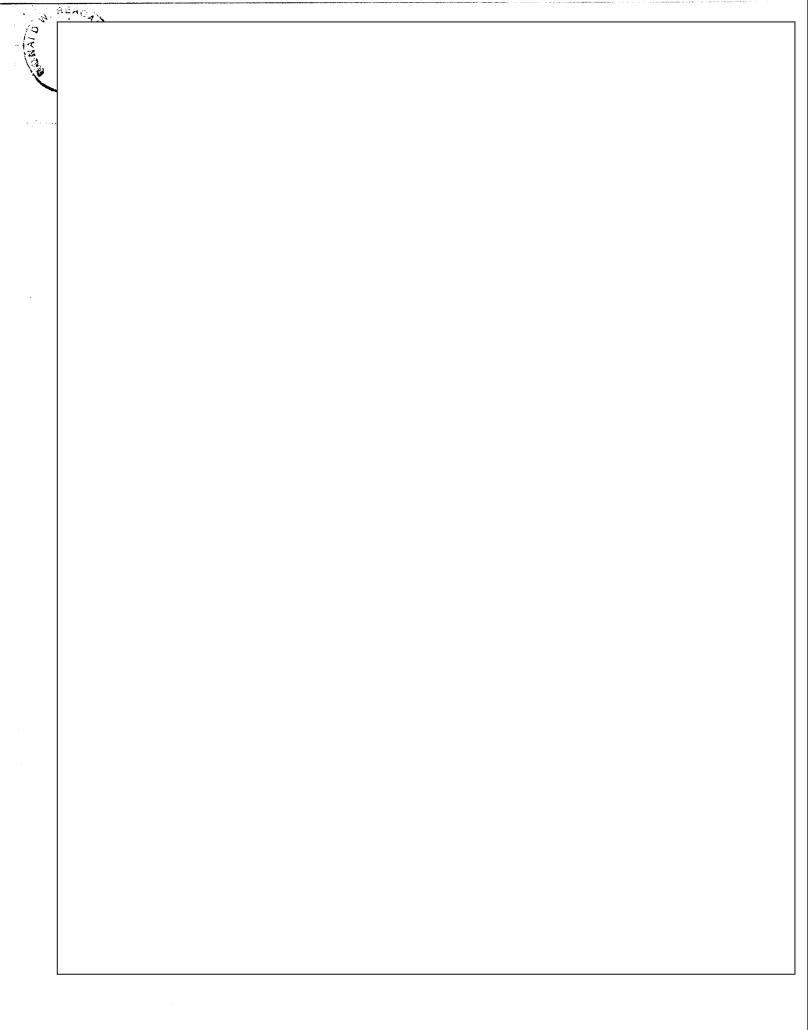


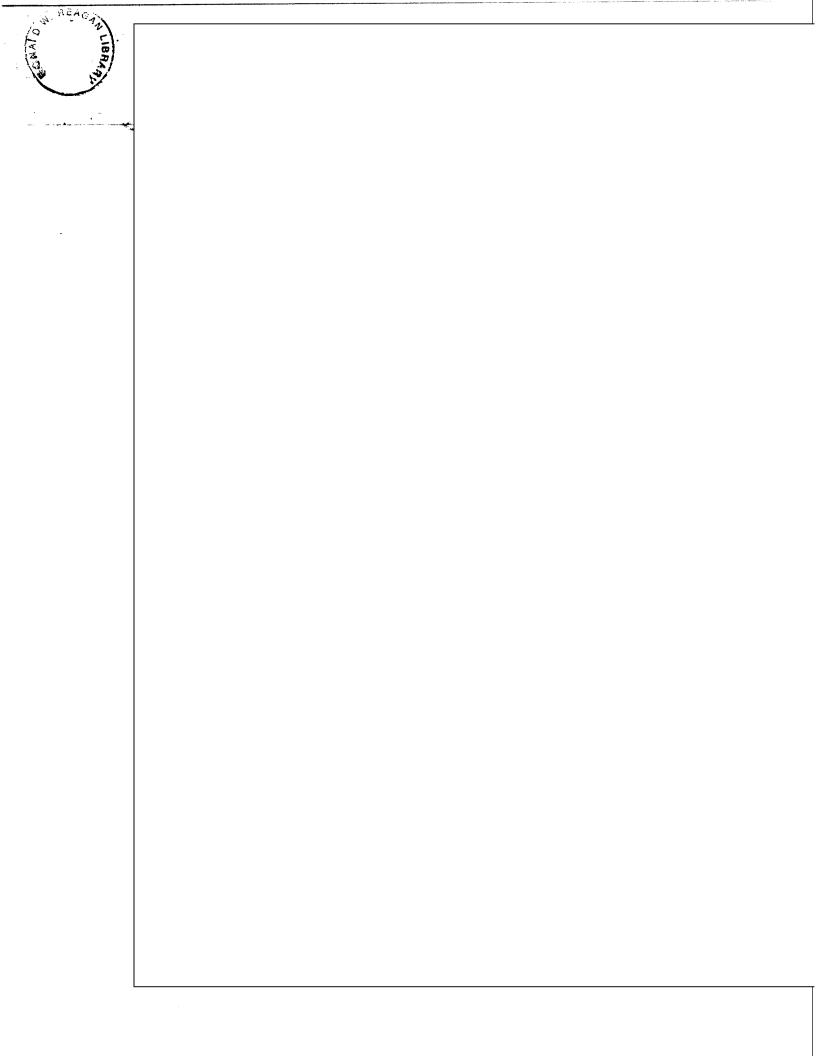


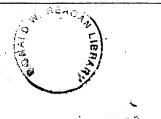














Annex C

Replacement Equipment Availability

Petroleum facility reconstruction following serious damage could take many months. The specific time needed to repair critical choke points and restore them to operation will depend on the availability of major components, materials, support equipment, and labor. Perhaps most essential is the accessibility of major components that are special-order or custom-designed capital items not normally stockpiled in the industry.

Before manufacturing orders are placed, prospects for obtaining items either through cannibalization or by purchase from existing inventories normally will be explored. For example, two of the single-point mooring buoys procured by Iraq for its Persian Gulf restoration effort had been already manufactured and were sitting in ports awaiting shipment to other customers. In many cases, however, these options are not open and it will be necessary to pursue the manufacturing route. The time required to manufacture equipment is contingent on the number of competing orders. This situation is now somewhat relaxed since many petroleum projects have been deferred because of current market conditions. Customers can, on some occasions, buy their way to the head of the queue by agreeing to pay premium prices

Even allowing for the current recession in equipment orders, leadtimes to delivery are long:

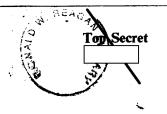
 It would be necessary to draw up detailed design specifications, unless off-the-shelf designs are acceptable. In many cases, the competitive bid process might be sought. Weeks might be required before a manufacturer is given a notice to proceed.

- Once the notice to proceed is given, the customer will be placed in the queue. During this time, it will be necessary to come up with detailed design drawings and other necessary material for the vendor.
- Fabrication time will be determined by the number of items being ordered. It is unlikely that large numbers of capital equipment can be manufactured simultaneously.

Once fabrication is complete, delivery and installation will in most cases take several more months.

The accompanying table indicates the time required to manufacture major petroleum equipment from the time notice to proceed is given to the completion of fabrication. This information is based on a survey of US equipment suppliers taken on 21 July 1982





Selected Major Petroleum Equipment: Manufacturing Leadtime as of 21 July 1982

Major Component	Days From Notice To Proceed to Completion of Fabrication (for first item)	Additional Days Required for Each Subsequent Item	
Loading arms (16 inch)	210 to 300	3 to 7	
Loading arms (24 inch)	450 to 480	6 to 21	
Single-point mooring buoy (SALM)	150	30	
Valves (over 24 inch control, check, block, or relief)	168	1 to 2	
Pumps (vertical)	182	2	
Pumps (horizontal—more than 500 HP)	360	2	
Drivers (electric motors—more than 500 HP)	280	2	
Stabilizer column (300,000 b/d capacity)	196	12 to 14	
Reboiler and heat exchanger	224	12 to 14	
Fin fan cooler	252	12 to 14	



Ton Secret

ingen, et e

Top Secret